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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/634,886 | 08/06/2003 | Tsutomu Asakawa | Q76840 | 7540 |
| 23373 | 7590 | 04/21/2006 | EXAMINER | |
| SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037 | | | MCDONALD, RODNEY GLENN | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1753 | |

DATE MAILED: 04/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/634,886

Applicant(s)

ASAKAWA ET AL.

Examiner

Rodney G. McDonald

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5,8,12,13 and 17-27 is/are pending in the application.
- 4a) Of the above claim(s) 17-20 and 27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,8,12,13 and 21-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2-21-06 has been entered.

Election/Restrictions

Newly submitted claims 17-20 and 27 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: the dust proof substrate can be made by a materially different process such as ion plating

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 17-20 and 27 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Allowable Subject Matter

The indicated allowability of claim 8 is withdrawn in view of the newly discovered reference(s) to Yoshihara (WO 02/055612) (Yoshihara U.S. Pat. 6,949,284 for translational purposes). Rejections based on the newly cited reference(s) follow.

Art Unit: 1753

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 3, 5, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahiro et al. (Japan 2001-188103) in view of Krisko (US PG PUB 2003/0228431 A1) and Umehara et al. (U.S. Pat. 6,577,375).

Regarding claims 1, 12, JP '103 teach a method of producing an a multilayer stack of antireflection films on a transparent substrate [claim 1]. The film comprises a first layer with a refractive index of 1.7-1.8, a second layer with a refractive index of 2.20 or more, and a third layer with a refractive index of 1.44-1.49 [0005]. The first thickness can range from 60 nm- about 95 nm. [0026] The second thickness can be 90 nm-125 nm. [0029] The third thickness is usually 80 nm – 100 nm. [0032] The first layer can

Art Unit: 1753

comprise silicon, oxygen, and tin [0024]. The second layer can comprise titanium and oxygen [0028]. The third layer can comprise silicon and oxygen [0031]. The first, second, and third layers can be formed by sputtering [0033]. The transparent substrate can be glass with a refractive index between 1.48-1.60. [0007] Applicant requires the surface roughness of the glass substrate to be 0.5 nm or less as the center-line-means roughness Ra. The surface roughness is an obvious limitation because one of ordinary skill in the art would inherently desire to have the surface roughness as small as possible so that distortions are not present on the LCD panel. Applicant requires particular transmittance and reflectance. Given that the layers are identical to Applicant's claimed layers the transmittance and reflectance features of applicant's claims are met.

Regarding claim 2, Applicant requires the films to be formed by reactive sputtering where the medium layer uses a target comprising silicon and tin, the high layer uses a target comprising titanium niobium, tantalum, or hafnium, and the low layer uses a target comprising silicon. JP '103 discloses the deposition to involve reactive sputtering where the target is an alloy target sputtered in an oxygen atmosphere [0034].

Regarding claim 3, Applicant requires each of the films to be deposited using a plurality of targets. Krisko is described above and uses a plurality of targets to deposit each layer (Figure 4).

Regarding claim 5, the first layer can comprise silicon, oxygen, and tin [0024]. The second layer can comprise titanium and oxygen [0028]. The third layer can comprise silicon and oxygen [0031].

The differences between JP '103 and the present claims is that the sputtering to be in an in-line sputtering system is not discussed (Claims 1, 12), the substrate being utilized for a liquid crystal panel used in a liquid crystal projector is not discussed (Claims 1, 12) and cutting the substrate is not discussed (Claim 13).

Regarding claims 1, 12, Krisko discloses depositing a multilayer coating on a substrate by sputtering (abstract). The apparatus to deposit the layer is an in-line sputtering apparatus (Figure 4).

The motivation for utilizing an in-line apparatus is that it allows for sputtering layers on a substrate. (See abstract; Figure 4)

Regarding claims 1, 12, Umehara et al. teach utilizing an anti-reflection coating on a substrate for a liquid crystal panel that is used in a liquid crystal projector. (Column 8 lines 25-27; Column 11 lines 52-68)

The motivation for utilizing an anti-reflection coating on a substrate for a liquid crystal panel that is used in a liquid crystal projector is that it allows for projection of an image. (Column 1 lines 8-13)

Regarding claim 13, Applicant requires cutting into the substrate of a predetermined size. The limitation is obvious. In order for the substrate to fit into a CRT or LCD, it must be a certain size. It is inherent that the substrate would need to be cut to fit the predetermined size.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Takahiro et al. '103 by utilizing in-line sputtering as taught by Krisko and to have utilizing the substrate with the antireflection

coating in a liquid crystal projector as taught by Umehara et al. because it allows for depositing layers and projecting images.

Claims 8 and 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahiro et al. (Japan 2001-188103) in view of Krisko (US PG PUB 2003/0228431 A1) and Yoshihara et al. (WO 02/055612 A1) (U.S. Pat. 6,949,284 used for translational purposes).

Regarding claims 8, 21, 22, 23, Takahiro et al. JP '103 teach a method of producing a multilayer stack of antireflection films on a transparent substrate [claim 1]. The film comprises a first layer with a refractive index of 1.7-1.8, a second layer with a refractive index of 2.20 or more, and a third layer with a refractive index of 1.44-1.49 [0005]. The first thickness can range from 60 nm- about 95 nm. [0026] The second thickness can be 90 nm-125 nm. [0029] The third thickness is usually 80 nm – 100 nm. [0032] The first layer can comprise silicon, oxygen, and tin [0024]. The second layer can comprise titanium and oxygen [0028]. The third layer can comprise silicon and oxygen [0031]. The first, second, and third layers can be formed by sputtering [0033]. The first layer can comprise silicon, oxygen, and tin [0024]. The second layer can comprise titanium and oxygen [0028]. The third layer can comprise silicon and oxygen [0031]. The transparent substrate can be glass with a refractive index between 1.48-1.60. [0007]

Regarding claim 24, Applicant requires the surface roughness of the glass substrate to be 0.5 nm or less as the center-line-means roughness Ra. The surface roughness is an obvious limitation because one of ordinary skill in the art would

Art Unit: 1753

inherently desire to have the surface roughness as small as possible so that distortions are not present on the LCD panel.

Regarding claim 25, the coating can be used for a liquid crystal display. [Claim 5]

The differences between Takahiro et al. JP'103 and the present claims is that forming the layers in an in-line sputtering apparatus is not discussed (Claim 8) and where a transparent conductive film is formed between the high refractive index layer and the low refractive index layer (Claim 8).

Regarding claim 8, Krisko discloses depositing a multilayer coating on a substrate by sputtering (abstract). The apparatus to deposit the layer is an in-line sputtering apparatus (Figure 4).

Regarding claim 8, Yoshihara et al. teach an antireflection coating 17 having a middle refractive index layer 18, a high refractive index layer 19 and a low refractive index layer 20. (See Fig. 2; Column 10 lines 20-24) Further in the antireflection coating a transparent conductive layer comprising ITO, ATO and the like is provided for the purpose of imparting an electrification preventing function, or a stain-proofing layer comprising a fluorine-based surfactant, fluorine-based silicone coating agent and the like is provided on the surface of a low refractive index layer, in some cases. (Column 20 lines 53-59)

The motivation for utilizing the transparent conductive layer in the antireflection coating is that it allows for providing an electrification preventing function. (Column 20 lines 53-59)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Takahiro et al. JP '103 by utilizing in-line sputtering as taught by Krisko and to have utilized a transparent conductive layer in the antireflection coating as taught by Yoshihara et al. because it allows for providing a multilayer coating and providing an electrification preventing function.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takahiro et al. JP '130 in view of Krisko and Yoshihara et al. as applied to claims 8 and 21-25 above, and further in view of Umehara et al. (U.S. Pat. 6,577,375).

The difference not yet discussed is the use of the liquid crystal panel in the liquid crystal projector.

Umehara et al. teach utilizing an anti-reflection coating on a substrate for a liquid crystal panel that is used in a liquid crystal projector. (Column 8 lines 25-27; Column 11 lines 52-68)

The motivation for utilizing a liquid crystal panel for a liquid crystal projector is that it allows for projecting an image. (Column 1 lines 8-14)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a liquid crystal panel for a liquid crystal projector as taught by Umehara et al. because it allows for projecting an image.

REMARKS:

It is argued that Takahiro et al. (JP 2001-188103) does not teach using the LCD in a liquid crystal projector. Newly cited Umehara et al. teach utilizing the LCD in a liquid crystal projector.

Art Unit: 1753

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Rodney G. McDonald
Primary Examiner
Art Unit 1753

RM
April 18, 2006